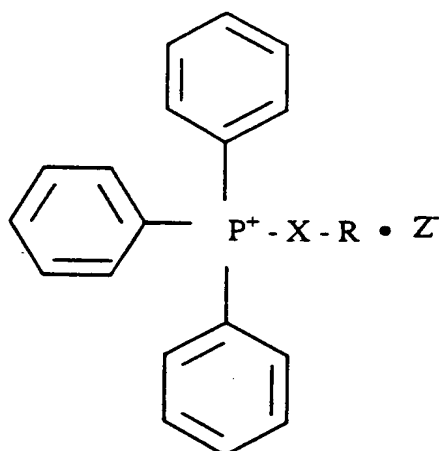


CLAIMS

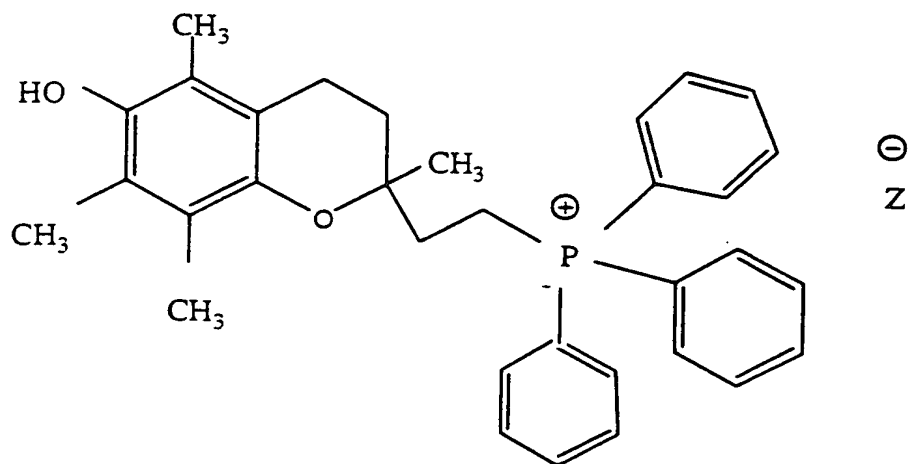
1. A mitochondrially-targeted antioxidant compound comprising a lipophilic cation covalently coupled to an antioxidant moiety, wherein the antioxidant moiety is capable of being transported through the mitochondrial membrane and accumulated within the mitochondria of intact cells, with the proviso that the compound is not thiobutyltriphenylphosphonium bromide.
2. A compound as claimed in claim 1 wherein the lipophilic cation is the triphenylphosphonium cation.
3. A mitochondrially-targeted antioxidant compound as claimed in claim 1, wherein said compound has the formula



wherein X is a linking group, Z is an anion, and R is an antioxidant moiety.

4. A compound as claimed in claim 3, wherein X is a C_1 to C_{30} carbon chain, optionally including one or more double or triple bonds, and optionally including one or more substituents and/or unsubstituted or substituted alkyl, alkenyl or alkynyl side chains.
5. A compound as claimed in claim 4, wherein X is $(\text{CH}_2)_n$ where n is an integer of from 1 to 20.
6. A compound as claimed in claim 5 wherein X is an ethylene, propylene, butylene, pentylene or decylene group.

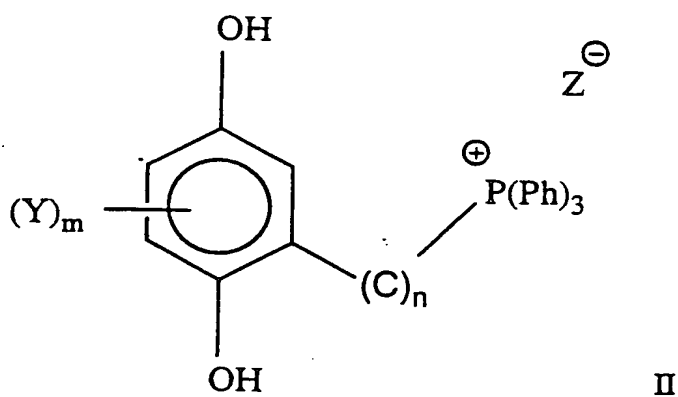
7. A compound as claimed in claim 3 wherein said compound has the formula



including all stereoisomers thereof.

8. A compound as claimed in claim 7 wherein Z is Br.

9. A compound as claimed in claim 3, having the formula



wherein:

Z is a pharmaceutically acceptable anion,

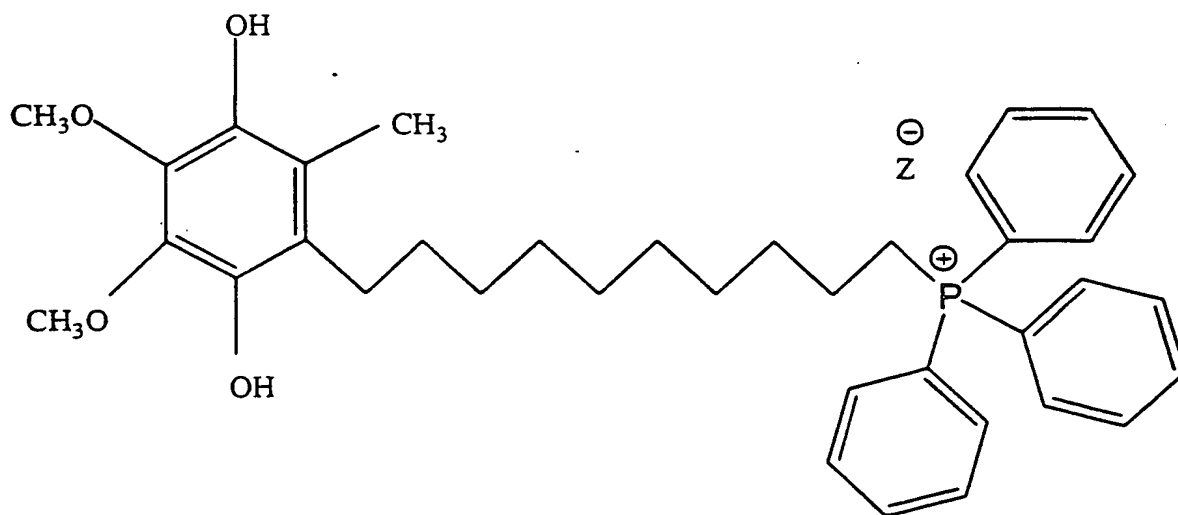
m is an integer of from 0 to 3,

each Y is independently selected from groups, chains and aliphatic and aromatic rings having electron donating and accepting properties,

(C)_n represents a carbon chain optionally including one or more double or triple bonds, and optionally including one or more substituents and/or unsubstituted or substituted alkyl, alkenyl or alkynyl side chains; and

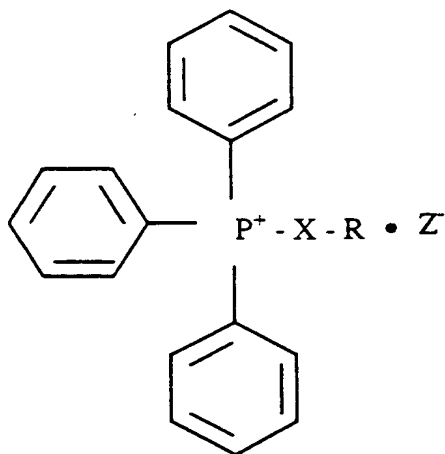
n is an integer of from 1 to 20.

10. A compound as claimed in claim 9, wherein (C)_n is an alkyl chain of the formula (CH₂)_n wherein n is an integer of from 1 to 20.
11. A compound as claimed in claim 10, wherein each Y is independently selected from the group consisting of alkoxy, thioalkyl, alkyl, haloalkyl, halo, amino, nitro and optionally substituted aryl, or when m is 2 or 3, two Y groups, together with the carbon atoms to which they are attached, form an aliphatic or aromatic carbocyclic or heterocyclic ring fused to the aryl ring.
12. A compound as claim in claim 11 wherein each Y is independently selected from methoxy and methyl.
13. A compound as claimed in claim 9 wherein said compound has the formula



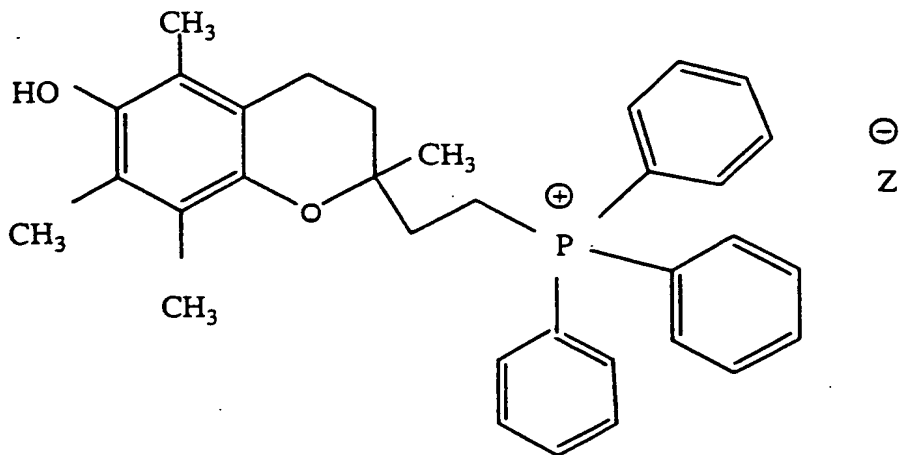
14. A compound as claimed in claim 13 wherein Z is Br.

15. A pharmaceutical composition suitable for the treatment of a patient who would benefit from reduced oxidative stress, which comprises an effective amount of a mitochondrially-targeted antioxidant as defined in claim 1 in combination with one or more pharmaceutically acceptable carriers or diluents.
16. A pharmaceutical composition as claimed in claim 15 wherein the mitochondrially-targeted antioxidant has the formula I

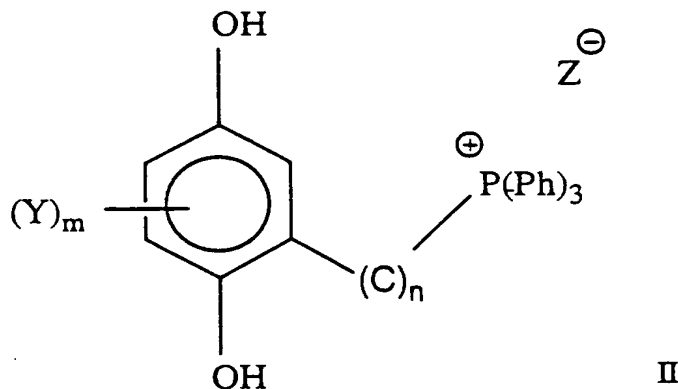


wherein X is a linking group, Z is an anion and R is an antioxidant moiety.

17. A pharmaceutical composition as claimed in claim 16 wherein the mitochondrially targeted antioxidant compound is



18. A pharmaceutical composition as claimed in claim 15 wherein the mitochondrially targeted antioxidant compound has the formula



10 wherein:

Z is a pharmaceutically acceptable anion,

m is an integer of from 0 to 3,

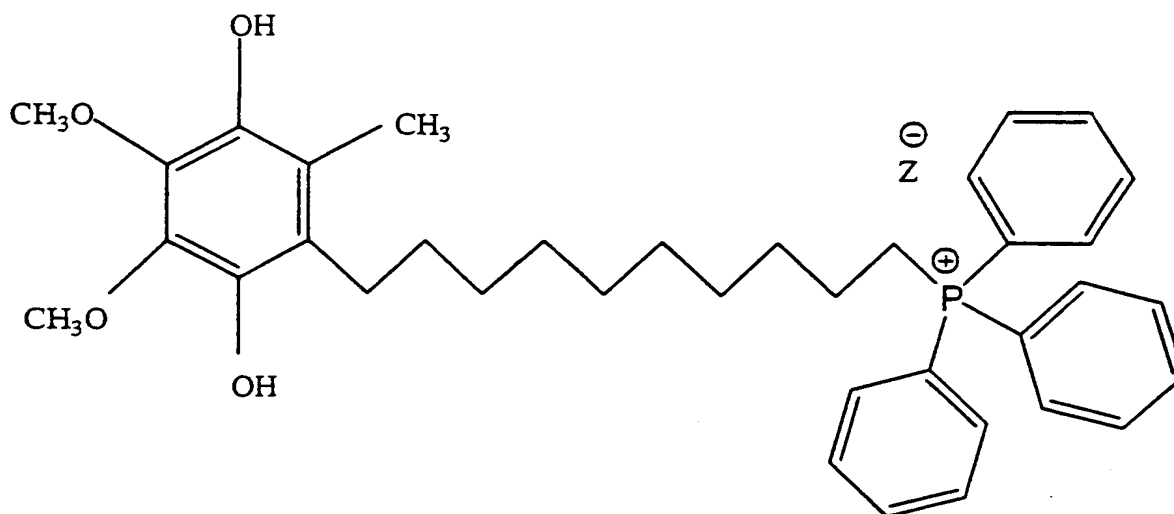
15 each Y is independently selected from groups, chains and aliphatic and aromatic rings having electron donating and accepting properties,

20 (C)_n represents a carbon chain optionally including one or more double or triple bonds, and optionally including one or more substituents and/or unsubstituted or substituted alkyl, alkenyl or alkynyl side chains; and

n is an integer of from 1 to 20.

- 25 19. A pharmaceutical composition as claimed in claim 18, wherein (C)_n is an alkyl chain of the formula (CH₂)_n wherein n is an integer of from 1 to 20.

20. A pharmaceutical composition as claimed in claim 18, wherein each Y is independently selected from the group consisting of alkoxy, thioalkyl, alkyl, haloalkyl, halo, amino, nitro and optionally substituted aryl, or, when m is 2 or 3, two Y groups, together with the carbon atoms to which they are attached, form an aliphatic or aromatic carbocyclic or heterocyclic ring fused to the aryl ring.
21. A pharmaceutical composition as claimed in claim 20, wherein each Y is independently selected from methoxy and methyl.
22. A pharmaceutical composition as claimed in claim 17 wherein the mitochondrially targeted antioxidant compound is:



23. A method of therapy or prophylaxis of a patient who would benefit from reduced oxidative stress, which comprises the step of administering to the patient a mitochondrially-targeted antioxidant as defined in claim 1.
24. A method of reducing oxidative stress in a cell which comprises the step of administering to the cell a mitochondrially-targeted antioxidant as defined in claim 1.